

REMARKS

The Examiner has rejected claims 1-22, 24-27 and 29-31. At the oral hearing held March 4, 2004, appellants' counsel withdrew the appeal as to claims 17-19. Therefore, the appeal as to claims 17-19 was dismissed, and the Decision on Appeal addressed the Examiner's rejections of claims 1-16, 20-22, 24-27 and 29-31. Claims 17-19 are canceled herein and new claim 32 is added.

Independent claims 1, 20, 21, and 22 have been amended herein to include subject matter argued by appellants but noted by the Board to be absent from the claims, namely that the blade wholly comprises the material cladded by the laser. Independent claims 20, 21, and 22 have been further amended herein to include subject matter argued by appellants but noted by the Board to be absent from the claims, namely that the blade is deposited in a near-net shape. New independent claim 32 is identical to amended claim 1 but further includes the near-net shape of the deposited blade. Previously, claims 13-15 were copied verbatim and claim 16 was substantially copied from Islam et al. U.S. Patent No. 5,855,149 for the purpose of provoking an Interference proceeding, and thus claims 13-16 are not amended herein. However, applicants assert that interfering subject matter still exists between applicants' amended claims and at least the copied claims of the Islam et al. patent.

On pages 15-16 of the Decision on Appeal, the Board indicated agreement with appellants position on the collective teachings of Baker and Maybon as described on page 13 of the brief, but stated that "[c]ontrary to appellants' assertions, we do not see that claim 1, as an

example, necessarily requires that the whole of the integral blade must be comprised entirely of the abrasion resistant material." In response, applicants have amended independent claims 1, 20, 21, and 22 and added new independent claim 32 such that each of these claims require that the "blade wholly comprises the material cladded by the laser." The claims are now consistent in scope with applicants argument that Baker does not teach laser cladding of the blade material and Maybon teaches only laser hardfacing of a ridge and teaches against a ridge wholly formed by laser cladding, and that the combined teachings of the references would only provide a tubular die with a bottom portion of the blade cast with the tubular die body, and a tip portion of the blade resurfaced with harder material. On this basis, the combination of the Baker and Maybon references fails to teach or suggest the claimed invention set forth in claims 1, 20, 21, 22 and 32 and their dependent claims, as amended herein, and applicants therefore respectfully request that the rejection as to those claims be withdrawn.

The Board further stated at page 11 of the Decision on Appeal that they "find nothing in Maybon which indicates that the patentee 'specifically avoids forming the entire ridge of the abrasion resistant material' or that this patent teaches away from appellants' invention. Applicants refer Examiner to the following passages in Maybon at Col. 2, lines 16-20 and 29-31 that support a finding of a teaching against, which passages appear to have been either overlooked by the Board or not considered in the proper light:

[T]he basic idea of the invention is to resurface the top of the ridges selectively using an appropriate abrasion resistant material, retaining for the base of the ridges and the bottom of the grooves a material which favors flow of paper pulp. . . .

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The solution of the invention is to resurface only the tops of the ridges of the plates by means of a laser beam in association with a powder injector.

In the case of the paper pulp refining plates, and as understood by a full and careful review of the Maybon patent, the ridges serve a dual purpose, namely comminuting fiber clumps and paper pulp flow. The base or lower part of the ridges and the grooves between the ridges must comprise a material having surface properties that facilitate the flow of pulp through the grooves and between the ridges. The soft cast metals have the desired surface properties. The tops of the ridges comprise a material having properties that facilitate comminuting fiber clumps. The abrasion resistant alloys that may be deposited by lasers have the desired hardness and abrasion resistant properties. Thus, the invention of Maybon is clearly directed to a plate that has ridges of two different materials to achieve the dual purpose, one of the materials being cast with the plate body and the other being deposited by a laser. If the ridges are wholly formed by laser cladding, then the plate would not operate as designed. Thus, Maybon clearly teaches against ridges wholly comprising the abrasion resistant material.

The Board further noted at page 10 of the Decision on Appeal that one of ordinary skill in the art would have an incentive to use the laser cladding technique of Maybon to apply the weld bead of Baker because "Maybon makes clear that the laser resurfacing process described therein has the advantage of accurate reproduction of the geometric shape of the resurfaced ridges/blades" Applicants agree that laser hardfacing or resurfacing aims to provide a hard,

thin layer that reproduces the geometric shape of the underlying base. However, in the method of forming blades on a rotary cutting die, the deposition creates a new, small geometrical shape on a large, planar die body surface. Thus, Baker and the present invention are directed to the creation of entire blades/ridges of a geometric shape not present on the surface. Reproduction onto an existing shape is not equivalent to the initial creation of the shape itself. Therefore, Maybon's teaching that lasers may be used to hardface existing geometric shapes would not, in fact, suggest to one of ordinary skill in the art that lasers may be used in place of known welding techniques to wholly create geometric shapes of often complex design. Thus, the combination of Baker and Maybon does not teach or suggest building an integral blade outwardly from a die body surface by laser cladding such that the blade wholly comprises the material clad by the laser, as acknowledged by the Board at page 15 of the Decision on Appeal. It is thus respectfully requested that the rejection of at least claims 1-12, 20-22, 24-27 and 29-32 be withdrawn.

On page 10 of the Decision on Appeal, the Board noted that the claims have "no requirement of initially forming 'near net shaped blades' or with regard to any particular degree of machining necessary to shape the blades into a final blade configuration." In response, applicants have amended claims 20, 21, and 22 and added new claim 32 such that each of these claims require that the blade material is deposited onto the die body surface to form a blade of near net shape. By definition, near net shape is close to the final desired shape, thereby requiring only a small degree of machining to shape the blade into a final blade configuration. This position is supported by the Declaration of Dr. Rey Hsu submitted on July 5, 2001 and Dr. Hsu's declaration

submitted herewith. Dr. Hsu, who's experience is extensive in both the welding and laser arts, has further declared that known welding techniques, such as that described in Baker, are incapable of depositing blades to a near net shape. Welding inherently deposits material in high excess and requires significant machining to shape the blade into a final blade configuration. In Dr. Hsu's declaration submitted herewith, Dr. Hsu sets forth the time and cost savings attributable to the method of the present invention of forming near net shape blade deposits by laser cladding and shaping by EDM in comparison to the welding method disclosed by Baker. This savings is considerable and establishes a clear and significant commercial and inventive benefit achieved by the present invention that is not achieved by the closest prior art, Baker. Moreover, Maybon does not suggest this benefit in that it only addresses forming and shaping a thin surface layer on an already formed ridge, as opposed to forming and shaping the entire ridge/blade itself. The use of laser cladding in entire blade formation achieves a benefit that could not have been fully appreciated through the teachings of Maybon. Thus, the combination of Baker and Maybon does teach or suggest near net shape depositing of entire blade formations on a die body by laser cladding and cannot appreciate the significant advantages obtained thereby. As declared by Dr. Hsu in the declaration submitted herewith, a time savings of 24-80 hours per die and a corresponding cost reduction of \$3000 per die translate to a huge savings in die manufacturing, specifically a 10% savings. Dr. Hsu's declaration is further submitted as evidence of commercial success for consideration in combination with all other declarations and customer accolades previously submitted as establishing the non-obviousness of the claimed

invention, including Dr. Hsu's 2001 declaration, Mr. Madill's declaration, and the customer accolades of Mr. Harrison and Mr. Bell.

Applicants further note that consideration of Maybon merely for teaching a laser as a heat source that may be substituted for the welding heat source of Baker is an oversimplification and fails to consider the references as a whole and the invention as a whole, including the unappreciated advantages of the claimed invention. "Focusing on the obviousness of substitutions and differences instead of on the invention as a whole . . . [is] a legally improper way to simplify the difficult determination of obviousness." *Ruiz v. A.B. Chance Co.*, 57 U.S.P.Q.2d 1161, 1167 (Fed. Cir. 2000) (citing *Hybritech Inc. v. Monoclonal Antibodies, Inc.*, 802 F.2d 1367, 1383, 231 U.S.P.Q. 81, 93 (Fed. Cir. 1986)). The invention as a whole overcomes longstanding problems in the rotary die industry with respect to cost, ease of manufacture, and die life, and these advantages are not taught or suggested by the combination of Baker and Maybon. Applicants have amended the claims herein to include limitations noted by the Board to missing from the claims, which limitations provide distinctions over the art of record. Applicants have further provided evidence of non-obviousness establishing the commercial advantages of the present invention that contribute to the commercial success of rotary cutting dies made in accordance with the claimed invention. It is therefore respectfully requested that a Notice of Allowability be issued for this application, at least with respect to claims 1-12, 20-22, 24-27 and 29-32, and that an Interference proceeding be initiated with the Islam et al. Patent.

Application No. 09/160,991
Amendment dated May 25, 2004
Reply to final Office Action of July 16, 2002

In view of the foregoing amendments to the claims and remarks given herein, and the attached declaration of Dr. Rey Hsu, Applicants respectfully believe this case is in condition for allowance and respectfully request allowance of the pending claims. If the Examiner believes any detailed language of the claims requires further discussion, the Examiner is respectfully asked to telephone the undersigned attorney so that the matter may be promptly resolved. The Examiner's prompt attention to this matter is appreciated.

Applicants are of the opinion that no additional fee is due as a result of this amendment. If any charges or credits are necessary to complete this communication, please apply them to Deposit Account No. 23-3000.

Respectfully submitted,

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